

Remarks

In the Final Office Action dated April 22, 2010, the following rejections are maintained: claims 1-2, 4-6, 9-12, 14-18, 21 and 24-25 stand rejected under 35 U.S.C. § 103(a) over Hwang (U.S. Patent No. 6,678,511); and claims 3, 13 and 22-23 stand rejected under 35 U.S.C. § 103(a) over the '511 reference in view of Chan (U.S. Patent No. 6,920,471); claims 1-2, 4-6, 9, 11-12, 14-16, 18, 21 and 24 stand rejected under 35 U.S.C. § 103(a) over Jeanjean (U.S. Patent No. 6,954,119) in view of the '511 reference. Applicant traverses all of the rejections and, unless stated by the Applicant, does not acquiesce to any objection, rejection or averment made in the Office Action.

Applicant respectfully traverses each of the rejections of claims 1-25 for relying upon an unsupported conclusion as to the operability of the proposed modification. The Examiner's conclusions fail to recognize that the second filter taught by the '511 reference is not a traditional band pass filter and do not consider the differences resulting therefrom. Each of the rejections presented by the Examiner relies upon the assertion that a skilled artisan would experiment to arrive at a combination of two filters that are cascaded and that differ in orders by exactly one. The Examiner's contention is that this would necessarily result from the teachings of the '511 reference (alone or in combination with the '119 reference) because such experimentation would result in an optimized solution in which the filters differ by exactly one. As the references do not suggest such optimization, it would appear that the Examiner reaches this conclusion because Applicant's specification teaches such aspects. While this represents impermissible hindsight reconstruction, it is also improper because the '511 reference does not teach the same configuration of cascaded filters described in Applicant's specification. In pertinent part, the '511 reference teaches the use of a complimentary band pass filter. As shown by the transfer functions in Figs. 6A and 6B, this complementary band pass filter has a different response than a traditional band pass filter (*e.g.*, the transfer function looks perhaps more similar to a notch filter). The Examiner has not presented an argument or evidence to suggest that a cascade of filters that includes such a complimentary band pass filter has the same properties, with respect to filter order, as a cascade of filters using two, more-traditional band pass filters. Accordingly, the Examiner's conclusions are improper because they fail to recognize or

consider the differences between a complimentary band pass filter and a more-traditional band pass filter. Because each of the rejections is premised upon this mistaken assertion regarding the '511 reference, Applicant respectfully requests that each of the rejections be withdrawn.

Applicant respectfully traverses the rejections of claims 21 and 24 for relying upon an unsupported assertion. Applicant challenges the Examiner's contention that "a filter with higher orders would provide a bandwidth wider than the bandwidth of a filter with lower orders." Final Office Action, p. 4. Applicant submits that the filter order is not directly-related to the bandwidth of the filter (*e.g.*, filters of varying orders can be designed for virtually any bandwidth). This assertion forms the basis for the Examiner's rejection, *i.e.*, that filter order would be adjusted for the purpose of increasing bandwidth. Accordingly, Applicant requests evidentiary support for this conclusion or withdrawal of the rejections that rely upon the apparent misstatement.

Applicant respectfully traverses the rejections of claims 1-2, 4-6, 9, 11-12, 14-16, 18, 21 and 24 over the '119 reference as modified by the '511 reference for relying upon an impermissible combination. Applicant submits that the combination of the primary '119 reference as modified by the secondary '511 reference is insufficient to establish a sustainable rejection because the proposed modification is contrary to the central teachings of the primary '119 reference. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." M.P.E.P. § 2143.01 citing to *In re Ratti*, 270 F.2d 810 (CCPA 1959). In particular, the central teachings of the primary '119 reference are directed towards carefully selected filters having specific relationships, whereas the Examiner's proposal would move away from these teachings and towards open-ended experimentations. The specifics of the proposed rejection and the improper nature thereof are discussed in more detail hereafter.

Applicant submits that the skilled artisan would not arrive at the claimed invention by relying upon the teachings of the secondary reference to modify the primary reference. It is not disputed that the '119 reference is not at all concerned with (nor suggests) designing filters to have passband ripples of nearly equal magnitude that are

also out of phase with each other. The primary purpose of the '119 reference is to approximate a higher order filter by careful design of a cascade of two lower-order filters (*see, e.g.*, Col. 4:43-61). To accomplish this goal, the '119 reference teaches how to create the desired filter characteristics by selecting the theoretical values for the components such that the lower order filter has a transfer function having the poles and/or zeros that are a subset of the higher order filter (*see, e.g.*, Col. 5:5-10). In particular, the primary '119 reference teaches that this is accomplished through the careful selection of resistive, capacitive and inductive values (*see, e.g.*, Col. 5:10-15). Applicant submits that modifications of these carefully selected component-based characteristics would impermissibly frustrate the primary purpose of the primary '119 reference by moving the poles and zeroes. Accordingly, the Examiner's apparent suggestion to modify the filter of the '119 reference, in a manner that is contrary to the central teachings thereof, renders the rejection improper.

Applicant further submits that the Examiner's response to arguments section does not address the substance of Applicant's arguments in this regard. Instead, the Examiner's response impermissibly overlooks the details of the teachings of the '119 reference. In pertinent part, the Examiner does not address that the '119 reference's central teachings are directed toward a specific relationship of poles and zeroes between the two filters and that the proposed modification would depart from these teachings in favor of open-ended experimentation. Accordingly, the rejections cannot be sustained and Applicant requests that they be withdrawn.

Applicant also traverses the rejection of claims 1-2, 4-6, 9, 11-12, 14-16, 18, 21 and 24 over the '119 reference as modified by the '511 reference for failing to show correspondence to the claim limitations. Applicant submits that the skilled artisan, upon following the teachings of the references, would not arrive at a combination that corresponds to the claim limitations as a whole. The secondary '511 reference teaches that, given the desired band pass filter (*e.g.*, in this case the pole/zero matched band pass filter of the '119 reference), the addition of a complementary band pass filter is to be used for ripple cancellation. Neither of the references, alone or in combination, suggests modifying aspects of the primary band pass filter to cancel ripple. Moreover, this additional complementary band pass filter of the secondary '511 reference, is only taught

to be successful when it has an order that differs from the primary band pass filter by much more than one. Accordingly, to the extent that the skilled artisan might seek to combine the teachings of the references, the only proper combination would include the addition of a complimentary filter, which when viewed as a whole would not correspond to the order-based limitations of Applicant's claimed invention.

Applicant respectfully traverses the rejections of claims 1-25 that rely upon the '511 reference because the rejections are based on a "routine experimentation" or "obvious to try" assertion that ignores the teaching-away evidence and contradicts one of the two situations, as explained in *In re Kubin*, in which the "obvious to try" standard may not be applied. The Examiner's response to arguments does not address the substance of Applicant's arguments in this regard because the Examiner's response does not provide evidence of teachings that would suggest how to experiment with the orders of the filters to improve cancellation of ripples in a system. Accordingly, as discussed in more detail below, the '511 reference does not provide guidance that would have led the skilled artisan down the path suggested by the Examiner.

The Examiner acknowledges that the asserted '511 reference does not expressly teach the invention as a whole, including aspects of the claimed invention that address the problem of passband ripples through the use of a composite filter that includes, among other aspects, two cascading filters having orders that differ by exactly one. In stark contrast, the Examiner relies upon an embodiment from the '511 reference that includes cascading filters having respective orders of nine and two or four, with teaching that optimization would be achieved, not by adjusting the orders of the filters, but rather by adjusting aspects of the amplifier and attenuator circuits in the Examiner's relied-upon embodiment. The Examiner provides no reason why the skilled artisan would be led along such a divergent research path involving entirely different parameters (adjustments to the filters as opposed to amplifier and attenuator circuits) and encompassing an unlimited number of possible combinations (involving all possible combinations of orders for the filters) of which the prior-art record provides a hint of success only for the respective orders of nine and two or four.

Accordingly, the Examiner's § 103 rejections are contrary to key principles in the patent law including:

- When the prior art teaches away by leading in a direction divergent from the path that was taken by the applicant, "discovery of a successful means of combining them is more likely to be non-obvious." *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (U.S. 2007); *In re Kubin* (Fed. Cir. April 3, 2009), *citing In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).
- The "obvious to try" standard may not be applied where one would have "to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful." *In re Kubin* (Fed. Cir. April 3, 2009), *interpreting KSR*. See also M.P.E.P. § 2143(E), and *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 725 (Fed. Cir. 1990) ("we have consistently held that 'obvious to try' is not to be equated with obviousness.").

The evidence put forth by the Examiner is little more than a conclusion that orders of the filters differing by exactly one is an obvious design choice to reach a condition which is "optimum" for some loosely-explained end goal. Contrary to the requirements of *Kubin*, the primary '511 reference does not indicate that the order of filters are critical parameters and does not provide the skilled artisan with a direction for selection of the orders.

Moreover, as explained in *In re Kubin*, the "obvious to try" standard may not be applied in situations (such as here) where one would have "to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful." *See also* M.P.E.P. § 2143(E) (a requirement for showing that a combination of elements is obvious to try is that there are a finite number of identified, predictable potential solutions). The '511 reference does not provide any direction as to which of the infinite number of filter order combinations is likely to be successful. Instead, the only working filter examples shown by the '511 reference deal with a specific concave-shaped ripple that is taught by the '511 reference to be adjusted by varying the parameters of attenuator and amplifier circuits, not by varying the orders of the filters. In view of this limited disclosure, the Examiner has not provided evidence that suggests that experimentation with such ripple characteristics would lead the skilled artisan to filters differing by exactly one, and the '511 reference does not provide any direction for the skilled artisan to experiment with the orders of the filters. Thus, the experimentation suggested by the Examiner is an

improper application of the “obvious to try” standard which would unduly include trying each of numerous possible choices of filter orders with no direction as to which of the many possible choices is likely to be successful.

For example, the Examiner’s reasoning would be applicable to an infinite number of filter combinations because the Examiner’s logic has no reliance upon teachings of the actual order of the filters. If Applicant had discovered that using filters differing in order by twenty or sixty or one million, the Examiner’s argument would not change. For example, the evidence of record is the same had the Examiner instead stated that selecting the optimum number for the second filter of the ‘511 reference to have the order difference of twenty or sixty or one million for the purpose of cancelling all of the ripples within the passband of the first filter is considered to be a matter of design expedient for the engineer depending on the ripples of the first filter that would have been obvious at the time of the invention. No evidence is provided to suggest how a skilled artisan would be led toward reaching the Examiner’s conclusion. For the Examiner to maintain the rejection on the evidence provided, the Examiner would have to conclude that an infinite number of filter combinations are obvious in view of only a few concrete filter circuit examples.

Applicant submits that the Examiner has not responded to Applicant’s showing that in order to maintain the rejection on the basis of the record the Examiner must conclude that it would have been obvious to arrive at a combination of any of an infinite number of different filter orders.

Moreover, the ‘511 reference teaches away from experimentation involving the orders of the filters 20 and 12 as proposed by the Examiner. Consistent with the recent Supreme Court decision, M.P.E.P. § 2143.01 explains the long-standing principle that a §103 rejection cannot be maintained when the asserted modification undermines either the operation or the purpose of the main (‘511) reference - the rationale being that the prior art teaches away from such a modification. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (U.S. 2007) (“[W]hen the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious.”). In this instance, the ‘511 reference teaches that the impact of the counter-ripple is adjusted, not by experimentation with the orders of the filters 20 and 12,

but by using the taught orders of the filters (*e.g.*, 9 stage and 2 or 4 stage) and varying other parameters such as the gains of the filter 12 and the amplifier circuit 11 and the attenuation characteristic of the first attenuator circuit 13. *See, e.g.*, Figure 4c and Col. 5:47-55. The '511 reference further teaches additional embodiments that involve adjusting the counter-ripple by varying parameters of amplifier 11 and attenuators 13 and 14. *See, e.g.*, Col. 6:35-63. Thus, the '511 reference teaches adjusting the counter-ripple to correct the whole passband flatness of the band pass filter by experimenting with parameters of amplifier and attenuator circuits, not by experimentation with the orders of the filters. As such, the '511 reference expressly teaches away from experimentation involving changing the orders of the filters. Accordingly, there is no motivation for the skilled artisan to modify the '511 reference in the manner proposed by the Examiner.

For these reasons, the record suggests that the Examiner has impermissibly used Applicant's teachings as the basis for the conclusion of obviousness. In this instance, the Examiner's assertions regarding routine experimentation require that the skilled artisan impermissibly work backward from Applicant's specification. The Examiner circularly requires that the skilled artisan realize that filters differing in order by exactly one provide the advantageous features taught only by Applicant's specification. Absent Applicant's specification, there is nothing in the record that would suggest to the skilled artisan that filters differing by exactly one would be advantageous. Thus, Applicant respectfully submits that the rejections are improper and requests that they be withdrawn.

Regarding the rejection of claims 21 and 24, the Examiner has not addressed Applicant's argument that the criticality of the ranges per M.P.E.P. § 2144.05 requires an explanation for how the limited examples presented in the cited references render specific and critical ranges obvious. Any presumption of obviousness of ranges has been rebutted by the criticality of the claim limitations taught by Applicant's specification. As discussed in M.P.E.P. § 2144.05, even where there are overlapping ranges, the obviousness can be rebutted by a showing of criticality. Applicant's disclosure teaches that a composite filter having orders of filters differing by exactly one is a critical aspect for ripple cancellation and for achieving the claimed filter characteristics. The surprising results of this specific configuration are shown in Tables 1-3 of Applicant's disclosure. Applicant has therefore rebutted any showing of obviousness due to overlapping ranges.

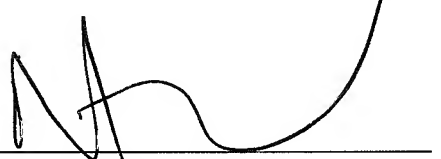
Accordingly, the cited references do not render the claimed invention obvious, and Applicant requests that the rejections be withdrawn.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, David Schaeffer, of NXP Corporation at (408) 474-9057 (or the undersigned).

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